

WE CLAIM:

1. A method of selecting a performance level to be used by a data processing
5 apparatus capable of operating at a plurality of different performance levels, said
method comprising the steps of:
calculating a plurality of performance requests using respective ones of a
plurality of performance request calculating algorithms;
combining said plurality of performance requests to form a global
10 performance request; and
selecting said performance level to be used by said data processing apparatus
from among said plurality of different performance levels in dependence upon said
global performance request.
- 15 2. A method as claimed in claim 1, when at least one of said plurality of
performance request calculating algorithms calculates a performance request
independently of other of said plurality of performance request calculating algorithms.
3. A method as claimed in claim 1, wherein at least one of said plurality of
20 performance request calculating algorithms calculates a performance request based
upon detected operating characteristics of said data processing apparatus.
4. A method as claimed in claim 1, wherein said step of selecting is temporally
independent of said steps of calculating and combining.
- 25 5. A method as claimed in claim 1, wherein said plurality of performance request
calculating algorithms are temporally independent of one another.
6. A method as claimed in claim 1, wherein said plurality of performance request
30 calculating algorithms are associated with a hierarchy of performance request
calculating algorithms, a performance request from a performance request calculating
algorithm being combined with other performance requests in dependent of a position
of said performance request calculating algorithm within said hierarchy of
performance request calculating algorithms.

7. A method as claimed in claim 6, wherein said hierarchy of performance request calculating algorithms is fully ordered.

5 8. A method as claimed in claim 6, wherein said hierarchy of performance request calculating algorithms is partially ordered and an operator is provided for combining performance requests from performance request calculating algorithms on a hierarchy common level.

10 9. A method as claimed in claim 8, wherein said operator is a maximum value selector.

10. A method as claimed in claim 6, wherein a first priority performance request from a first priority performance request calculating algorithm can override a second
15 priority performance request from a second priority performance request calculating algorithm when said first performance request calculating algorithm has a more dominant position within said hierarchy of performance request calculating algorithms than said second performance request calculating algorithm.

20 11. A method as claimed in claim 1, wherein at least one of said plurality of performance request calculating algorithms generates a command accompanying a performance request specifying how that performance request should be combined with other performance requests.

25 12. A method as claimed in claim 6, wherein said command specifies that said performance request should override any performance request from a performance calculating algorithm with a less dominant position in said hierarchy of performance request calculating algorithms.

30 13. A method as claimed in claim 6, wherein said command specifies that said performance request should be selected in preference to any lower performance level performance request from a performance calculating algorithm in a less dominant position in said hierarchy of performance request calculating algorithms.

14. A method as claimed in claim 11, wherein said command specifies that said performance request should be ignored irrespective of any other performance level requests.

5 15. A method as claimed in claim 6, wherein said performance requests are combined starting from a performance request from a performance request calculating algorithm having a least dominant position within said hierarchy of performance request calculating algorithms working through to a performance request from a performance request calculating algorithm having a most dominant position within
10 said hierarchy of performance request calculating algorithms.

16. A method as claimed in claim 1, wherein at least some of said steps calculating, combining and selecting are performed by one or more of:

an operating system kernel;
15 firmware of said data processing apparatus;
hardware within said data processing apparatus.

17. A method as claimed in claim 1, wherein at least one of said plurality of performance request calculating algorithms is responsive to deadline information from
20 a real time operating system kernel.

18. A method as claimed in claim 1, wherein at least one of said plurality of performance request calculating algorithms is responsive to information from an operating system kernel.
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19. A method as claimed in claim 1, wherein at least one of said plurality of performance request calculating algorithms is responsive to information from an application program, a device or a device driver.

30 20. A method as claimed in claim 19, wherein said information is indicative of a change in operating conditions and said at least one performance request calculating algorithm is operable to recalculate a respective one of said plurality of performance requests in response to receipt of said information.

21. Apparatus for selecting a performance level to be used by a data processing apparatus capable of operating at a plurality of different performance levels, said apparatus comprising:

calculating logic operable to calculate a plurality of performance requests
5 using respective ones of a plurality of performance request calculating algorithms;
combining logic operable to combine said plurality of performance requests to
form a global performance request; and
selecting logic operable to select said performance level to be used by said
data processing apparatus from among said plurality of different performance levels in
10 dependence upon said global performance request.

22. Apparatus as claimed in claim 21, when at least one of said plurality of
performance request calculating algorithms calculates a performance request
independently of other of said plurality of performance request calculating algorithms.

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23. Apparatus as claimed in claim 21, wherein at least one of said plurality of
performance request calculating algorithms calculates a performance request based
upon detected operating characteristics of said data processing apparatus.

20 24. Apparatus as claimed in claim 21, wherein said step of selecting is temporally
independent of said steps of calculating and combining.

25. Apparatus as claimed in claim 21, wherein said plurality of performance
request calculating algorithms are temporally independent of one another.

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26. Apparatus as claimed in claim 21, wherein said plurality of performance
request calculating algorithms are associated with a hierarchy of performance request
calculating algorithms, a performance request from a performance request calculating
algorithm being combined with other performance requests in dependent of a position
30 of said performance request calculating algorithm within said hierarchy of
performance request calculating algorithms.

27. Apparatus as claimed in claim 26, wherein said hierarchy of performance
request calculating algorithms is fully ordered.

28. Apparatus as claimed in claim 26, wherein said hierarchy of performance request calculating algorithms is partially ordered and an operator is provided for combining performance requests from performance request calculating algorithms on
5 a hierarchy common level.

29. Apparatus as claimed in claim 28, wherein said operator is a maximum value selector.

10 30. Apparatus as claimed in claim 26, wherein a first priority performance request from a first priority performance request calculating algorithm can override a second priority performance request from a second priority performance request calculating algorithm when said first performance request calculating algorithm has a more dominant position within said hierarchy of performance request calculating algorithms
15 than said second performance request calculating algorithm.

31. Apparatus as claimed in claimed claim 21, wherein at least one of said plurality of performance request calculating algorithms generates a command accompanying a performance request specifying how that performance request should
20 be combined with other performance requests.

32. Apparatus as claimed in claim 26, wherein said command specifies that said performance request should override any performance request from a performance calculating algorithm with a less dominant position in said hierarchy of performance
25 request calculating algorithms.

33. Apparatus as claimed in claim 26, wherein said command specifies that said performance request should be selected in preference to any lower performance level performance request from a performance calculating algorithm in a less dominant
30 position in said hierarchy of performance request calculating algorithms.

34. Apparatus as claimed in claim 31, wherein said command specifies that said performance request should be ignored irrespective of any other performance level requests.

35. Apparatus as claimed in claim 26, wherein said performance requests are combined starting from a performance request from a performance request calculating algorithm having a least dominant position within said hierarchy of performance request calculating algorithms working through to a performance request from a performance request calculating algorithm having a most dominant position within said hierarchy of performance request calculating algorithms.

36. Apparatus as claimed in claim 21, wherein at least some of said steps calculating, combining and selecting are performed by one or more of:
an operating system kernel;
firmware of said data processing apparatus;
hardware within said data processing apparatus.

37. Apparatus as claimed in claim 21, wherein at least one of said plurality of performance request calculating algorithms is responsive to deadline information from a real time operating system kernel.

38. Apparatus as claimed in claim 21, wherein at least one of said plurality of performance request calculating algorithms is responsive to information from an operating system kernel.

39. Apparatus as claimed in claim 21, wherein at least one of said plurality of performance request calculating algorithms is responsive to information from an application program, a device or a device driver.

40. Apparatus as claimed in claim 39, wherein said information is indicative of a change in operating conditions and said at least one performance request calculating algorithm is operable to recalculate a respective one of said plurality of performance requests in response to receipt of said information.

41. A computer program product bearing a computer program for controlling a computer to select a performance level to be used by said computer, said computer

being capable of operating at a plurality of different performance levels, said computer program comprising:

calculating code operable to calculate a plurality of performance requests using respective ones of a plurality of performance request calculating algorithms;

5 combining code operable to combine said plurality of performance requests to form a global performance request; and

selecting code operable to select said performance level to be used by said data processing apparatus from among said plurality of different performance levels in dependence upon said global performance request.

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42. A computer program product as claimed in claim 41, when at least one of said plurality of performance request calculating algorithms calculates a performance request independently of other of said plurality of performance request calculating algorithms.

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43. A computer program product as claimed in claim 41, wherein at least one of said plurality of performance request calculating algorithms calculates a performance request based upon detected operating characteristics of said computer.

20 44. A computer program product as claimed in claim 41, wherein said step of selecting is temporally independent of said steps of calculating and combining.

45. A computer program product as claimed in claim 41, wherein said plurality of performance request calculating algorithms are temporally independent of one
25 another.

46. A computer program product as claimed in claim 41, wherein said plurality of performance request calculating algorithms are associated with a hierarchy of performance request calculating algorithms, a performance request from a
30 performance request calculating algorithm being combined with other performance requests in dependent of a position of said performance request calculating algorithm within said hierarchy of performance request calculating algorithms.

47. A computer program product as claimed in claim 46, wherein said hierarchy of performance request calculating algorithms is fully ordered.
48. A computer program product as claimed in claim 46, wherein said hierarchy of performance request calculating algorithms is partially ordered and an operator is provided for combining performance requests from performance request calculating algorithms on a hierarchy common level.
49. A computer program product as claimed in claim 48, wherein said operator is a maximum value selector.
50. A computer program product as claimed in claim 46, wherein a first priority performance request from a first priority performance request calculating algorithm can override a second priority performance request from a second priority performance request calculating algorithm when said first performance request calculating algorithm has a more dominant position within said hierarchy of performance request calculating algorithms than said second performance request calculating algorithm.
51. A computer program product as claimed in claim 41, wherein at least one of said plurality of performance request calculating algorithms generates a command accompanying a performance request specifying how that performance request should be combined with other performance requests.
52. A computer program product as claimed in claim 46, wherein said command specifies that said performance request should override any performance request from a performance calculating algorithm with a less dominant position in said hierarchy of performance request calculating algorithms.
53. A computer program product as claimed in claim 46, wherein said command specifies that said performance request should be selected in preference to any lower performance level performance request from a performance calculating algorithm in a less dominant position in said hierarchy of performance request calculating algorithms.

54. A computer program product as claimed in claim 51, wherein said command specifies that said performance request should be ignored irrespective of any other performance level requests.

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55. A computer program product as claimed in claim 46, wherein said performance requests are combined starting from a performance request from a performance request calculating algorithm having a least dominant position within said hierarchy of performance request calculating algorithms working through to a performance request from a performance request calculating algorithm having a most dominant position within said hierarchy of performance request calculating algorithms.

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56. A computer program product as claimed in claim 46, wherein at least some of said steps calculating, combining and selecting are performed by one or more of:

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- an operating system kernel;
- firmware of said data processing apparatus;
- hardware within said data processing apparatus.

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57. A computer program product as claimed in claim 41, wherein at least one of said plurality of performance request calculating algorithms is responsive to deadline information from a real time operating system kernel.

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58. A computer program product as claimed in claim 41, wherein at least one of said plurality of performance request calculating algorithms is responsive to information from an operating system kernel.

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59. A computer program product as claimed in claim 41, wherein at least one of said plurality of performance request calculating algorithms is responsive to information from an application program, a device or a device driver.

60. A computer program product as claimed in claim 59, wherein said information is indicative of a change in operating conditions and said at least one performance

request calculating algorithm is operable to recalculate a respective one of said plurality of performance requests in response to receipt of said information.